

CLAIMS

1. A dc-ac converter, comprising:

a dc power supply;

a transformer having a primary winding and at least one secondary winding;

a semiconductor switch circuit for passing a current alternately in a first direction and a second direction from said dc power supply to said primary winding;

a load connected to said secondary winding;

a current detection circuit for detecting the current flowing through said load to generate a current detection signal indicative of the current detected;

a voltage detector circuit for detecting the voltage impressed on said load to generate a voltage detection signal indicative of the voltage detected;

a triangular wave signal generation circuit for generating a triangular wave signal;

a slow-start circuit for generating a slow-start signal that rises slowly during a startup of said load;

a PWM control signal generation circuit for generating a PWM control signal, said PWM control signal generation circuit adapted to

receive said triangular wave signal, current detection signal, voltage detection signal, and slow-start signal;

generate an error signal based on said current detection signal and voltage detection signal;

automatically select either one of said error signal and said slow-start signal based on the magnitudes of said signals; and

compare the selected signal with said triangular wave signal to generate said PWM control signal, and wherein

said semiconductor switch circuit is switched on and off based on said PWM control signal.

2. The dc-ac converter according to claim 1, wherein said PWM control signal generation circuit includes:

an error signal generation circuit for automatically selecting one of a current error signal and a voltage error signal in accordance with the magnitudes of said error signals and for outputting the selected error signal as said error signal, wherein

said current error signal is generated based on the difference between said current detection signal and a reference current signal, and

said voltage error signal is generated based on the difference between said voltage detection signal and a reference voltage signal; and

a PWM signal comparator adapted to

receive said triangular wave signal, error signal, and slow-start signal;

select either one of said error signal and said slow-start signal based on the magnitudes thereof; and

compare said selected signal with said triangular wave signal to generate said PWM control signal.

3. The dc-ac converter according to claim 2, wherein said error signal generation circuit includes:

a first error amplifier for generating a first error output upon comparison of said current detection signal with said reference current signal;

a second error amplifier for generating a second error output upon comparison of said voltage detection signal with said reference voltage signal;

a first control element controlled by said first error output; and

a second control element controlled by said second error output, wherein

the output ends of said first and second control elements are connected with each other to output said error signals from the node of said output ends.

4. The dc-ac converter according to claim 3, wherein said error signal generation circuit includes a first and a second feedback capacitors, with said first feedback capacitor connected between said node and the input end of said first error amplifier receiving said current detection signal, and said second feedback capacitor connected between said node and the input end of said second error amplifier receiving said voltage detection signal.

5. The dc-ac converter according to claim 1, wherein said load is a cold cathode fluorescent light.

6. A controller IC for driving a semiconductor switch circuit to control the ac output power thereof to be supplied to a load, comprising:

a triangular wave signal generation block connected to an external oscillation capacitor and an external oscillation resistor, for generating a triangular wave signal;

a slow-start block connected to an external startup capacitor, for generating a slow-start signal that rises slowly during a startup of said load; and

a PWM control signal generation circuit for generating a PWM control signal, said PWM control signal generation circuit adapted to

receive said triangular wave signal, current detection signal generated by detecting the current flowing through the load, voltage detection signal generated by detecting the voltage impressed on the load, and slow-start signal;

generate an error signal based on said current detection signal and voltage detection signal;

automatically select either one of said error signal and said slow start signal based on the magnitudes of said signals; and

compare the selected signal with said triangular wave signal to generate said PWM control signal, and wherein

said semiconductor switch circuit is switched on and off based on said PWM control signal.

7. The controller IC according to claim 6, wherein said PWM control signal generation circuit includes:

an error signal generation circuit for automatically selecting one of a current error signal and a voltage error signal in accordance with the magnitudes of said error signals and for outputting the selected error signal as said error signal, wherein

said current error signal is generated based on the difference between said current detection signal and a reference current signal, and

said voltage error signal is generated based on the difference between said voltage detection signal and a reference voltage signal; and

a PWM signal comparator adapted to

receive said triangular wave signal, error signal, and slow-start signal;

select either one of said error signal and said slow-start signal based on the magnitudes thereof; and

compare said selected signal with said triangular wave signal to generate said PWM control signal.

8. The controller IC according to claim 7, wherein said error signal generation circuit includes:

a first error amplifier for generating a first error output upon comparison of said current detection signal with said reference current signal;

a second error amplifier for generating a second error output upon comparison of said voltage detection signal with said reference voltage signal;

a first control element controlled by said first error output; and
a second control element controlled by said second error output,
wherein

the output ends of said first and second control elements are
connected with each other to output said error signal from the node of
said output ends.

9. The controller IC according to claim 8, wherein said error signal
generation circuit includes a first and a second feedback capacitors,
with said first feedback capacitor connected between said node and the
input end of said first error amplifier receiving said current detection
signal, and said second feedback capacitor connected between said node
and the input end of said second error amplifier receiving said voltage
detection signal.